## REMARKS

## 35 USC §102

Claims 1-23 are rejected under 35 USC §102(b) as being anticipated by Sato (JP 06025839, as cited in the IDS).

The Applicant disagrees, especially in view of the amendments presented in this case, which are supported by at least Example 1 of the current application.

Claim 1 recites:

"A sputtering target, comprising:

a target surface component comprising a target material;

a core backing component having a coupling surface and a back surface, wherein the coupling surface is coupled to the target surface component; and

at least one surface area feature coupled to or located in the back surface of the core backing component, wherein the surface area feature increases the effective surface area of the core backing component, and wherein the core backing component comprises a center cooling design."

Claim 12 recites:

"A sputtering target, comprising:

a target surface component comprising a target material;

a core backing component having a coupling surface and a back surface, wherein the coupling surface is coupled to the target surface component; and

at least one surface area feature coupled to or located in the back surface of the

core backing component, wherein the surface area feature comprises a subtractive feature, an additive feature or a combination thereof, wherein the surface area feature increases the effective surface area of the core backing component, and wherein the core backing component comprises a center cooling design."

Claims 22-23 recite:

"22. A method of forming a sputtering target, comprising:

providing a target surface component comprising a surface material;

providing a core backing component comprising a backing material and having a coupling surface and a back surface;

providing at least one surface area feature coupled to or located in the back surface of the core backing component, wherein the surface area feature increases the effective surface area of the core backing component, and wherein the core backing component comprises a center cooling design; and

coupling the surface target component to the coupling surface of the core backing component.

23. (Currently Amended) A method of forming a sputtering target, comprising:

providing a target surface component comprising a surface material;

providing a core backing component comprising a backing material and having a coupling surface and a back surface;

providing at least one surface area feature coupled to or located in the coupling surface of the core backing component, wherein the surface area feature increases the effective surface area of the core backing component, and wherein the core backing component comprises a center cooling design allowing the cooling fluid to contact the center of the core backing component

initially; and

coupling the surface target component to the coupling surface of the core backing component."

All of these independent claims contain the provision wherein the core backing component comprises a center cooling design. The benefits of the center cooling design are clearly shown in Example 1 and the related Figures, as compared to a conventional non-center-cooled design; and therefore, this design choice is not merely one of choice, but instead is one of novel functionality.

The Examiner states in the current Final Office Action that the phrase "center cooling design" does not have any support in the specification. This statement is not true. Example 1, coupled with Figures 8 and 9, distinguish a side cooling target from a center cooling design target and show the benefits of a center cooling design. One of ordinary skill in the art of target design would read "center cooling design", within the context of this application, as a target design distinguished from side cooling where the liquid contacts the center of the target, as opposed to the side of the target.

The Examiner has also indicated that he believes that one of ordinary skill in the art would not read "center cooling design" and know what that concept means generally. The Applicant disagrees and herein provides two references that refer to this type of design in different contexts. US 6641701 assigned to Applied Materials, Inc. ("Applied") shows a center cooling design where the coolant enters a tube placed at the center of the backside of the target. The difference between the Applied reference and the current claims is the presence of surface features on the surface of the current claimed materials. This aspect is important, because until Honeywell put surface features on the core backing component, it was not considered as something that could be utilized with center cooling. As a matter of fact, none of the Applied products contained surface area features until Honeywell had

developed the current materials. WO 94/001596 discloses a center cooling design that is implemented in order to cool solder layer interfaces between two surfaces. The hypothesis is that applying a cooling at the center of one of the surfaces, where the solder is in the middle of two surfaces, causes the solder to cool more effectively resulting in fewer defects, cracks and bubbles in the solder. Both of these references are submitted herein as an Information Disclosure Statement.

The Sato reference clearly does not disclose a center cooling design. The Figures in Sato, along with the description, show that the coolant enters one side of the target and flows to the next – where it exits. None of the figures show that the coolant enters at the center of the target or surface and flows to both sides.

In the current Office Action, the Examiner appears to be reading the provision directed to a center cooling design incorrectly. The center cooling design is where the core backing component is designed such that the cooling fluid can contact the center of the target initially before moving out to other sections of the backing component. The advantages of this design are experimentally shown in the current application.

The Sato reference, as discussed above, does not include this design feature, and therefore, this reference is not relevant for this case as it stands now. In addition, Sato does not anticipate the above-referenced independent claims that recite the present subject matter. "Anticipation requires the disclosure in a single prior art reference of each element of the claim under consideration." *W. L. Gore & Assocs. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303, 313 (Fed. Cir. 1983) (citing *Soundscriber Corp. v. United States*, 360 F.2d 954, 148 USPQ 298, 301 (Ct. Cl.), *adopted*, 149 USPQ 640 (Ct. Cl. 1966)) Further, the prior art reference must disclose each element of the claimed invention "**arranged as in the claim**". *Lindermann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 221 USPQ 481, 485 (Fed. Cir. 1984)(citing *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 220 USPQ 193 (Fed. Cir. 1983)). Sato does not teach or contain the provision that the core backing component has a center cooling design. Based on this argument, along with others such as that discussed above, Sato does not anticipate

claims 1, 12, 22, 23 or 24 of the present application because Sato is lacking and/or missing at least one specific feature or structural recitation found in the present application, and in claims 1, 12, 22 or 23. Claim 1, 12, 22 or 23 are therefore allowable as not being anticipated by Sato. Further, Sato does not anticipate claims 2-11, 13-21 of the present application by virtue of their dependency on claims 1, 12, 22 or 23.

## 35 USC §103

Claims 24-34 are rejected under 35 USC §103(a) as being unpatentable over Sato in view of Demaray.

Claims 35-45 are rejected under 35 USC §103(a) as being unpatentable over Sato in view of Mishima.

The Applicant disagrees, especially in view of the amendments presented herein.

Previously presented claim 24 recites:

"A sputtering target, comprising:

an integrated target surface component and core backing component, wherein the surface component and the backing component comprise the same target material; and

at least one surface area feature that is on or integrated into the core backing component, wherein the surface area feature increases the effective component of the core backing component, and wherein the core backing component comprises a center cooling design."

Previously presented claim 35 recites:

"A sputtering target, comprising:

an integrated target surface component and core backing component, wherein the sputtering target comprises a target material gradient; and

at least one surface area feature that is located on or integrated into the core backing component, wherein the surface area feature increases the effective

component of the core backing component, and wherein the core backing component comprises a center cooling design."

All of these independent claims contain the provision wherein the core backing component comprises a center cooling design. The benefits of the center cooling design are clearly shown in Example 1 and the related Figures, as compared to a conventional non-center-cooled design. In the current Office Action, the Examiner appears to be reading the provision directed to a center cooling design incorrectly. The center cooling design is where the core backing component is designed such that the cooling fluid can contact the center of the target initially before moving out to other sections of the backing component. The advantages of this design are experimentally shown in the current application. The Sato reference does not include this design feature, and therefore, this reference is not relevant for this case as it stands now.

The Examiner states in the current Final Office Action that the phrase "center cooling design" does not have any support in the specification. This statement is not true. Example 1, coupled with Figures 8 and 9, distinguish a side cooling target from a center cooling design target and show the benefits of a center cooling design. One of ordinary skill in the art of target design would read "center cooling design", within the context of this application, as a target design distinguished from side cooling where the liquid contacts the center of the target, as opposed to the side of the target.

The Examiner has also indicated that he believes that one of ordinary skill in the art would not read "center cooling design" and know what that concept means generally. The Applicant disagrees and herein provides two references that refer to this type of design in different contexts. US 6641701 assigned to Applied Materials, Inc. ("Applied") shows a center cooling design where the coolant enters a tube placed at the center of the backside of the target. The difference between the Applied reference and the current claims is the presence of surface features on the surface of the current claimed materials. This aspect is important, because until Honeywell put surface features on the core backing component, it was not considered as something that could be utilized with

center cooling. As a matter of fact, none of the Applied products contained surface area features until Honeywell had developed the current materials. WO 94/001596 discloses a center cooling design that is implemented in order to cool solder layer interfaces between two surfaces. The hypothesis is that applying a cooling at the center of one of the surfaces, where the solder is in the middle of two surfaces, causes the solder to cool more effectively resulting in fewer defects, cracks and bubbles in the solder. Both of these references are submitted herein as an Information Disclosure Statement.

The Sato reference clearly does not disclose a center cooling design. The Figures in Sato, along with the description, show that the coolant enters one side of the target and flows to the next – where it exits. None of the figures show that the coolant enters at the center of the target or surface and flows to both sides.

The Demaray reference does not cure the deficiencies of the Sato reference, because the Demaray reference teaches a cooling cover plate that fits on to the back of the target assembly that forms closed channels of cooling fluid. In this particular reference, there is no surface area feature that is on or integrated into the core backing component, wherein the surface area feature increases the effective component of the core backing component, and there is no embodiment where all of the effective surface area of the core backing component is in contact with cooling fluid or where the core backing component comprises a center cooling design.

The Mishima reference does not cure the deficiencies of the Sato reference, because it also does not teach, disclose or suggest to one of ordinary skill in the art that the effective surface area of the core backing component is in contact with cooling fluid or that the core backing component comprises a center cooling design.

Therefore, claims 24 and 35 are allowable as patentable over Sato, Demaray, and Mishima – alone or in combination. In addition, claims 25-34 and 36-45 are allowable by virtue of their dependence on claims 24 and 35, respectively.

## REQUEST FOR TELECONFERENCE INTERVIEW

The Applicant through the undersigned Attorney of Record is herein submitting a request for an interview to discuss the Sato reference and respectfully requests an urgent interview, if a notice of allowance is not warranted based on this Response. Dr. Thompson can be reached at 949-224-6282 on Mondays-Fridays from 9AM-4PM PST. In addition, the Applicants may ask Dr. Susan Strothers to be on the call to discuss the center cooling design and discuss a possible declaration to stress this provision should one be necessary.

## REQUEST FOR ALLOWANCE

Claims 1-45 are pending in this application and the Applicant respectfully requests that the Examiner reconsider the claims in light of the arguments presented and allow all pending claims.

Respectfully submitted,

Buchalter Nemer, A Professional Corp.

Dated: August 27, 2010

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